

Area of impact: Health

3. (a) **Identify *two* limitations of the Wii as a simulation.** [2 marks]

- cannot be modified to suit individuals
- real world is unpredictable and complex unlike the Wii simulations
- range of sensors and remotes is limited
- simulation is 2D not 3D, which may affect depth visualizations.

Award [1 mark] for each point up to a maximum of [2 marks].

(b) **Describe *two* other potential uses of the technology incorporated within the Wii video game console.** [4 marks]

- military training using motion sensors to simulate situations
- educational programs which enhance learning and challenge students, as well as games where students may challenge other students or the computer
- online communication over the Internet with other individuals.

Examiners should be aware that candidates may take a different approach, which, if appropriate, should be rewarded.

Award [1 mark] for each potential use identified. Award an additional [1 mark] for each relevant description up to a maximum of [2 marks]. Mark the first two correct potential uses identified.

(c) **Explain how *two* devices that are not physically connected can communicate with each other.** [4 marks]

Answers may include **two** devices that use:

- **Wi-Fi (wireless network)**
 - also known as 802.11 uses radio waves to communicate across a wireless network, similar to a two-way radio communication
 - a computer's wireless adapter translates data into a radio signal and transmits it using an antenna
 - a wireless router receives the signal, decodes it and then sends the information to the Internet using a physical, wired Ethernet connection
 - they transmit at frequencies of 2.4 gigahertz (GHz) (802.11b, (802.11g)) or 5GHz (802.11a).
- **WiMax (worldwide interoperability for microwave access)**
 - also known as 802.16, has the benefits of broadband and wireless and can provide high-speed wireless Internet over very long distances (unlike typical Wi-Fi).

- **Bluetooth**

- Bluetooth is essentially a short-range radio or short-range wireless communication
- the Bluetooth RF transceiver operates at 2.4 GHz (the same range of frequencies used by microwaves and Wi-Fi)
- uses frequency hopping to combat interference that are designed to operate in noisy radio frequency environments
- avoids interference from other signals by hopping to a new frequency after transmitting or receiving information.

- **Infrared**

- allows computing devices to communicate via short-range wireless signals and transfer files and other digital data bidirectionally – the infrared transmission technology used in computers is similar to that used in consumer product remote control units
- wireless infrared communication is the propagation of light waves in the near infrared band as a transmission medium
- the communication can be between one portable communication device and another or between a portable device and a tethered device, called an access point or base station
- typical portable devices include laptop computers, PDAs, and portable telephones, while the base stations are usually connected to a computer with other networked connections
- infrared technology used in local networks exists in three different forms, IrDA-SIR (slow speed), IrDA-MIR (medium speed), IrDA-FIR (fast speed).

[1 mark]

A limited response that indicates very little understanding of the topic.

[2–3 marks]

A reasonable description of devices, although the answer may lack how device communicates.

[4 marks]

A clear, detailed explanation of devices with clear understanding of how each device works.

(d) Evaluate the role of video game consoles in the healthcare of the elderly. [10 marks]

- involves a pleasing combination of mental and physical exercise, along with positive social interaction
- because of the video game system, technology-savvy residents are now interested in other technologies such as reading the local newspaper online
- good physical exercise
- mental improvements
 - exercises the brain
 - improves concentration
 - having fun while keeping active
 - not bored, “don’t know that they’re doing” therapy
- socialization
 - tournaments – great interaction with others
 - clapping and cheering fans
 - cross-generational, kids can play with grandparents
- physical improvements
 - range of motion
 - standing and balancing
 - endurance
 - posture
 - hand-eye coordination
 - arm movement
 - dexterity.

In part (d) of this question it is acceptable if there is more emphasis on the ITGS terminology related to social and ethical impacts and less on IT technical terminology.

Please see generic markband information sheet on page 21.